REAMPUTATION.

Major Chapple, M.D., Ch.B., M.R.C.S., D.P.H., Major R.A.M.C., Operating Surgeon, Pavilion Military Hospital for Limbless Men, writing in the *British Medical Journal,* says in part :—

Assuming that a reamputation of a limb has to be done, at what period after the primary amputation should it be undertaken?

The practice of surgeons differs widely. Some wait for healing and a "clean" operation which often takes months. But an experience of the use of button-sutures threaded through vulcanite boat-shaped buttons or indiarubber tubing acting as a support for the flaps and taking all the tension off the skin stitches shows that it is possible to reamputate in the presence of suppurating surfaces with almost complete certainty of union either by first intention or a kind of second intention, with preservation of the apposition of the flaps and the covering of the end of the bone.

Men upon whom an urgent amputation has been done in France arrive at hospitals in Britain after an interval varying from several days to a week or two.

If the amputation has been of the guillotine variety, the incision in the skin has been clean and circular, the skin is retracted up the limb, the muscle surfaces have retracted to a lesser degree, the end of the bone is exposed and protruding, and all the surfaces are bathed in pus.

Sometimes flaps have been attempted, and a similar condition exists, with the addition that the flaps may be large, hanging, and ragged at the edges from stitches which have cut through owing to suppuration.

My own invariable practice ever since the commencement of the war has been to allow these cases to settle down in hospital for a few days and then to reamputate, stitching the skin edges together as for a clean operation. During the waiting days the exposed surfaces are dressed with moist antiseptics, and when the general condition (usually disturbed by the journey and the necessary handling) has improved, the resistance has reached its maximum and the temperature has become steady, though slightly elevated, the patient is considered ready for operation.

When there was nothing other than the condition of the stump to consider, reamputation has, as a rule, been done within a week or ten days of the patient coming in.

In no case have the skin and soft tissues failed to heal over the end of the bone by either first or second intention, with at worst, and rarely, a small granulation area at the point where the drainage tube was left in for the first twenty-four or forty-eight hours; or where some pus had formed at a skin stitch or between two stitches. Even when this pus has formed it has not interfered with the complete healing of the soft tissues over the end of the bone and the union of the skin, usually within twenty-one days. In no case has the end of the bone appeared or been exposed even to the probe after a reamputation. That this is not the general rule there is abundant evidence at the Pavilion Military Hospital for Limbless Men. It would appear that reamputations have been done and the bone shortened, but that the condition of the stump has reverted to its original state, the skin and other soft tissues retracted, and the bone exposed, the only difference being that the limb is shorter.

The secret of healing by primary or by secondary, or rather delayed primary, union in septic cases is the relief given to the skin stitches by the "button-sutures" planted well back from the incision, and arranged staple-wise in such a way and position as to bear the whole weight of the flaps and keep them in apposition.

The "second intention" to which I have referred is a union in the presence of or following suppuration affecting the skin edges, but not sufficient to separate those edges from each other (either by the stitches cutting through or by sloughing) to such a distance as to prevent the epithelial margins from uniting without the intervention of a granulation area.

As the button-sutures carry all the weight of the flaps and bear all the tension, the skin stitches have no other function than to keep the skin edges opposite one another and prevent bulging of subcutaneous tissues. In short stumps the loss of another inch of bone by reamputation may seriously curtail locomotion. With button-sutures less provision has to be made for long flaps to meet contraction, and therefore valuable length is saved. These button-sutures tend also to keep the severed tendinous ends and muscle edges in apposition over the end of the bone. This either gives attachment between the two groups of locomotor muscles over, or it gives attachment to, the end of the bone. If it unites by close fibrous intervention over the end of the bone the result is a greater muscle purchase, and therefore a greater power of movement of the stump than would follow an attachment higher up the shaft, which is usual when muscles are allowed to retract after amputation. . . . It

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